

## **SENIOR DESIGN PROJECT: DRONE 1 ABSTRACT**

Our initial goal as a team was to build a drone that would effectively identify heat signatures using a FLIR-style type of thermal sensor for surveying purposes. This sensor, paired with a speaker and Arduino sound board, would be used to create an audio emission upon detecting an object in a set temperature range. We had also planned to mount some proximity sensors to add automation to the drone, removing the need for a controller. We decided on a quad-rotor drone for its stability, ease of use, practicality, and affordable price range.

However, we found that the building and setup of the drone was not “turnkey,” and in fact required a full assembly and programming of all relative modules as well as calibration of all onboard sensors required for flight. This did require us to alter our goal for the project, but also allowed us to fine tune adjustments and take the time to thoroughly check the flight systems while making improvements. We found this project challenging in a positive way for all of us. The final product is a hand-assembled, quad-rotor drone that has been fully programmed, calibrated, and set up by the team. Unfortunately, the drone does not have any of the originally planned sensors that would have allowed for autonomous surveying. However, it is completely prepared for flight, and will be ready for any plans the next team may have for it when they are ready to begin. The drone also has a 3D printed battery mount file that serves as a template that can be modified in SolidWorks and reprinted for the needs of the next group. Finally, the drone processing board does have the capability to include and merge with a thermal sensor in the future, and we have done the preliminary programming to allow additional sensors to co-exist.